TABLES

OF

CHEMICAL FORMULÆ.

ARRANGED BY

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[*Price One Shilling.*]

TABLES OF CHEMICAL FORMULÆ.

Table I.

Atomic Weights and Symbols.

Class I. *Perissad Elements and Chlorides.*

	Symbol.	Atomic weight.	Element.	Monochloride, X Cl.	Trichloride, $X Cl_3$.	Pentachloride, $X Cl_5$.
Monads.	H	1	Hydrogen	H Cl		
	F	19	Fluorine	—		
	Cl	35·5	Chlorine	Cl Cl		
	Br	80	Bromine	Br Cl ?	—	$Br Cl_5$
	I	127	Iodine	I Cl	$I Cl_3$	—
	Li	7	Lithium	Li Cl		
	Na	23	Sodium	Na Cl		
	K	39	Potassium	K Cl		
	Rb	85	Rubidium	Rb Cl		
	Cs	133	Cæsium	Cs Cl		
	Tl	203	Thallium	Tl Cl	$Tl Cl_3$	
	Ag	108	Silver	Ag Cl	—	
	Au	196·5	Gold	Au Cl	$Au Cl_3$	
Triads.	N	14	Nitrogen		$N Cl_3$	$NH_4 Cl$
	P	31	Phosphorus		$P Cl_3$	$P Cl_5$
	As	75	Arsenic		$As Cl_3$	—
	Sb	122	Antimony		$Sb Cl_3$	$Sb Cl_5$
	Bi	210	Bismuth		$Bi Cl_3$	—
	B	11	Boron		$B Cl_3$	
	Al	27·5	Aluminum		$Al Cl_3$	

Table II.

Atomic Weights and Symbols.

Class II. *Artiad Elements and Chlorides (Dyads).*

Symbol.	Atomic weight.	Element.	Dichloride, $X Cl_2$.	Tetrachloride, $X Cl_4$.	Hexachloride, $X Cl_6$.
O	16	Oxygen	$O Cl_2$	—	—
S	32	Sulphur	$S Cl_2$	$S Cl_4$	$S O_2 Cl_2$
Se	79·5	Selenium	—	$Se Cl_4$	$Se O_2 Cl_2$
Te	129	Tellurium	$Te Cl_2$	$Te Cl_4$	$Te O_2(HO)_2$
Mo	96	Molybdenum	$Mo Cl_2$	$Mo Cl_4$	$Mo O_2 Cl_2$
V	137	Vanadium	—	$V Cl_4$	$V Cl_6$
W	184	Tungsten	—	$W Cl_4$	$W Cl_6$
Ca	40	Calcium	$Ca Cl_2$		
Sr	87·5	Strontium	$Sr Cl_2$		
Ba	137	Barium	$Ba Cl_2$		
Mg	24	Magnesium	$Mg Cl_2$		
Zn	65	Zinc	$Zn Cl_2$		
Cd	112	Cadmium	$Cd Cl_2$		
Hg	200	Mercury*	$Hg Cl_2$		
Pb	207	Lead	$Pb Cl_2$	$Pb Et_4$	
Cr	52·5	Chromium*	$Cr Cl_2$	—	$Cr O_2 Cl_2$
Mn	55	Manganese*	$Mn Cl_2$	$Mn Cl_4$?	$Mn O_2 (HO)_2$
Fe	56	Iron*	$Fe Cl_2$	—	$Fe O_2 (HO)_2$
Co	59	Cobalt	$Co Cl_2$		
Ni	59	Nickel	$Ni Cl_2$		
Cu	63·5	Copper*	$Cu Cl_2$		
G	9	Glucinum	$G Cl_2$		
Yt	64	Yttrium	$Yt Cl_2$		
Ce	92	Cerium*	$Ce Cl_2$		
La	92	Lanthanum	$La Cl_2$		
Dy	96	Didymium	$Dy Cl_2$		
U	120	Uranium *	$U Cl_2$		

Table III.

Atomic Weights and Symbols.

Class II. *Artiad Elements and Chlorides.* (*Tetrads.*)

Symbol.	Atomic weight.	Element.	Dichloride, XCl_2.	Tetrachloride, XCl_4.	Hexachloride, XCl_6.
C	12	Carbon	CCl_2 ?	CCl_4	
Si	28	Silicon	$SiCl_2$?	$SiCl_4$	
Sn	118	Tin	$SnCl_2$	$SnCl_4$	
Ti	50	Titanium		$TiCl_4$	
Zr	89·5	Zirconium		$ZrCl_4$	
Ta	138	Tantalum		$TaCl_4$	
Cb	195	Columbium		$CbCl_4$	
Th	238	Thorinum		$ThCl_4$	
Ro	104	Rhodium*	$RoCl_2$	—	
Ru	104	Ruthenium*	$RuCl_2$	—	
Pd	106·5	Palladium	$PdCl_2$	$PdCl_4$	
Pt	197	Platinum	$PtCl_2$	$PtCl_4$	
Ir	197	Iridium	$IrCl_2$	$IrCl_4$	$IrCl_6$
Os	199	Osmium	$OsCl_2$	$OsCl_4$	$OsCl_6$

Table IV.

Atomic Weights and Symbols.

Periss-artiad Elements and Chlorides.

Symbol.	Atomic weight.	Element.	Monochloride, (XCl).	Dichloride, XCl_2.	Trichloride, (XCl_3).
Hg	200	Mercury	(HgCl)	$HgCl_2$	—
Cu	63·5	Copper	(CuCl)	$CuCl_2$	—
Cr	52·5	Chromium		$CrCl_2$	($CrCl_3$)
Mn	55	Manganese		$MnCl_2$	($MnCl_3$)
Fe	56	Iron		$FeCl_2$	($FeCl_3$)
Ce	92	Cerium		$CeCl_2$	($CeCl_3$)
U	120	Uranium		UCl_2	(UCl_3)
Ro	104	Rhodium		$RoCl_2$	($RoCl_3$) ?
Ru	104	Ruthenium		$RuCl_2$	($RuCl_3$) ?

Table V.

Illustrative Simple Oxides.

Type	X_2O.	XO or X_2O_2.	X_2O_3.	XO_2 or X_2O_4.	X_2O_5.	XO_3 or X_2O_6.	X_2O_7.	XO_4 or X_2O_8.
	Monoxide.		Trioxide.		Pentoxide.		Heptoxide.	
Perissads.	H_2O	(H_2O_2)	—		—		—	
	Cl_2O		Cl_2O_3	(Cl_2O_4)	Cl_2O_5 ?		Cl_2O_7 ?	
	—		—		I_2O_5		I_2O_7	
	K_2O	(K_2O_2)	—	(K_2O_4)	—			
	Tl_2O		Tl_2O_3		—			
	Au_2O		Au_2O_3		—			
	N_2O	(N_2O_2)	N_2O_3	(N_2O_4)	N_2O_5			
	—		P_2O_3		P_2O_5			
	—		Bi_2O_3		Bi_2O_5			
	—		B_2O_3		—			
		Isoxide.		Diploxide.		Triploxide.		Tetraploxide.
Artiads.		—		SO_2		SO_3		
		—		TeO_2		TeO_3		
		MoO		MoO_2		MoO_3		
		—		WO_2		WO_3		
		BaO		BaO_2		—		
		ZnO		—		—		
		PbO		PbO_2		—		
		CO		CO_2		—		
		SnO		SnO_2		—		
		PdO		PdO_2		—		
		IrO		IrO_2		IrO_3		
		OsO		OsO_2		OsO_3		OsO_4
Peris-artiads.	(Hg_2O)	HgO						
		CrO	(Cr_2O_3)	CrO_2 ?		CrO_3		
		MnO	(Mn_2O_3)	MnO_2		MnO_3 ?	(Mn_2O_7)?	
		FeO	(Fe_2O_3)			FeO_3 ?		
	(Cu_2O)	CuO	(Cu_2O_3)					
		CeO	(Ce_2O_3)					
		UO	(U_2O_3)					

Table VI.

Atomic Heat.

Element.	Atomic weight.	Specific heat.	Sp. heat × at. weight.	Atomic heat.
Bromine	80	·08432	6·7456	1·0956
Iodine	127	·05412	6·8732	1·1163
Lithium	7	·94080	6·5856	1·0696
Sodium	23	·29340	6·7480	1·0959
Potassium	39	·16956	6·6128	1·0740
Thallium	203	·03355	6·8106	1·1061
Silver	108	·05701	6·1570	1·0000
Gold	196·5	·03244	6·3744	1·0353
Phosphorus	31	·18870	5·8497	0·9501
Arsenic	75	·08140	6·1050	0·9915
Antimony	122	·05077	6·1939	1·0060
Bismuth	210	·03084	6·4764	1·0518
Aluminum	27·5	·21430	5·8730	0·9539
Sulphur	32	·17760	5·6832	0·9234
Selenium	79·5	·08270	6·6541	1·0807
Tellurium	129	·04737	6·1107	0·9925
Tungsten	184	·03342	6·1492	0·9987
Magnesium	24	·24990	5·9976	0·9741
Zinc	65	·09555	6·2588	1·0165
Cadmium	112	·05669	6·3482	1·0310
Mercury	200	·03192	6·3849	1·0370
Lead	207	·03140	6·4999	1·0556
Manganese	55	·12170	6·6934	1·0871
Iron	56	·11379	6·3722	1·0349
Cobalt	59	·10696	6·3106	1·0249
Nickel	59	·10863	6·4090	1·0409
Copper	63·5	·09515	6·0419	0·9813
Tin	118	·05623	6·6356	1·0777
Rhodium	104	·05803	6·0583	0·9849
Palladium	106·5	·05927	6·3122	1·0252
Platinum	197	·03243	6·3887	1·0376
Iridium	197	·03259	6·4202	1·0427
Osmium	199	·03113	6·1948	1·0061

Table VII.

Equivalent Notation.

Atomic weights of metals.	Atomic formulæ.	Chlorides.	Equivalent formulæ.	Equivalent weights of metals.
1	H Cl	Chlorhydric acid	H Cl	1
196·5	Au′ Cl	Aurous chloride	Au Cl	196·5
,,	Au‴ Cl_3	Auric chloride	au Cl	65·5
118	Sn″ Cl_2	Stannous chloride	sn Cl	59
,,	Sn⁗ Cl_4	Stannic chloride	stn Cl	29·5
197	Pt″ Cl_2	Platinous chloride	pt Cl	98·5
,,	Pt⁗ Cl_4	Platinic chloride	ptn Cl	49·2
200	Hg′ Cl	Mercurous chloride	Hg Cl	200
,,	Hg″ Cl_2	Mercuric chloride	hg Cl	100
63·5	Cu′ Cl	Cuprous chloride	Cu Cl	63·5
,,	Cu″ Cl_2	Cupric chloride	cu Cl	31·7
56	Fe″ Cl_2	Ferrous chloride	fe Cl	28
,,	Fe‴ Cl_3	Ferric chloride	ffe Cl	18·7
52·5	Cr″ Cl_2	Chromous chloride	cr Cl	26·2
,,	Cr‴ Cl_3	Chromic chloride	ccr Cl	17·5

Table VIII.

Normal Vapour-densities.

Molec. formulæ.	Gas or vapour.	Molec. weight, 2 vols.	Specific gravity, 1 vol.	Molec. formulæ.	Gas or vapour.	Molec. weight, 2 vols.	Specific gravity, 1 vol.
H_2	Hydrogen	2	1	$(CN)_2$	Cyanogen	52	26
Cl_2	Chlorine	71	35·5	C N H	Prussic acid	27	13·5
Br_2	Bromine	160	80	C N Cl	Cyan. chloride	61·5	30·7
I_2	Iodine	254	127	C O	Carbonic oxide	28	14
O_2	Oxygen	32	16	C Cl_2 O	Phosgene gas	99	49·5
S_2	Sulphur	64	32	C H_2 O_2	Formic acid	46	23
Se_2	Selenium	159	79·5	C O_2	Carbonic anhyd.	44	22
N_2	Nitrogen	28	14	C S_2	Carbon disulph.	76	38
HCl	Chlorhyd. ac.	36·5	18·2	C H_4	Marsh-gas	16	8
HgCl	Calomel	235·5	117·7	C H Cl_3	Chloroform	119·5	59·7
HBr	Bromhyd. ac.	81	40·5	C H_4 O	Wood-spirit	32	16
HI	Iodhydric ac.	128	64	C H_5 N	Methylamine	31	15·5

Table IX.

Normal Vapour-densities (*continued*).

Molecular formulæ.	Gas or vapour.	Molec. weight.	Specific gravity.	Molecular formulæ.	Gas or vapour.	Molec. weight.	Specific gravity.
H_2O	Water	18	9	C_2H_2	Klumene	26	13
H_2S	Sulphydric ac.	34	17	C_2H_4	Ethylene	28	14
H_2Se	Selenhyd. acid	81·5	40·7	C_2H_4O	Aldehyd	44	22
H_2T	Tellurhyd.acid	131	65·5	C_2HCl_3O	Chloral	147·5	73·7
Cl_2Sn	Stannous chlo.	189	94·5	C_2Cl_4O	Perchloral	182	91
Cl_2Hg	Corrosive sub.	271	135·5	$C_2H_4O_2$	Acetic acid	60	30
Et_2Cd?	Cadmium-eth.	170	85	$C_2HCl_3O_2$	Trichloracetic	163·5	81·7
Et_2Zn	Zinc-ethyl	123	61·5	C_2H_6	Ethene	30	15
H_3N	Ammonia	17	8·5	C_2H_5Cl	Ethyl chloride	64·5	32·2
H_3P	Phosphine	34	17	$C_2H_4Cl_2$	Ethylene dichl	99	49·5
H_3As	Arsine	78	39	C_2H_6O	Alcohol	46	23
H_3Sb	Stibine	125	62·5	C_2H_6S	Mercaptan	62	31
Cl_3Bi	Bismuth chlor.	316·5	158·2	$C_2H_6O_2$	Glycol	62	31
Cl_3B	Boron chloride	117·5	58·7	C_2H_7N	Ethylamine	45	22·5
Cl_4Si	Silicon chlor.	170	85	$C_2H_8N_2$	Ethylen-diam.	60	30
Cl_4Sn	Stannic chlor.	260	130	C_3H_6O	Acetone	58	29
Cl_4Ti	Titanic chlor.	192	96	$C_4H_8O_2$	Acetic ether	88	44
Cl_4Ta	Tantalic chlor.	280	140	$C_4H_{10}O$	Ether	74	37
Cl_4Cb	Columbic chl.	337	168·5	$C_4H_{10}S$	Ethyl sulphid.	90	45
SO_2	Sulphurous an.	64	32	$C_4H_{10}S_2$	Ethyl disulp.	122	61
SO_3	Sulphuric anh.	80	40	C_5H_{10}	Amylene	70	35
Cl_2S_2	Chlorine disul.	135	67·5	C_6H_6	Phenene	78	39
Cl_2SO_2	Sulph. oxychl.	135	67·5	C_6H_6O	Phenol	94	47
Cl_2CrO_2	Chrom. oxych.	155·5	77·7	C_6H_7N	Aniline	93	46·5
N_2O	Nitrous oxide	44	22	C_7H_6O	Benzoic ald.	106	53
N_2O_4	Nitric peroxid.	92	46	$C_7H_6O_2$	Benzoic acid	122	61
HNO_3	Nitric acid	63	31·5	$C_{10}H_8$	Naphthalene	128	64
$ClNO$	Chlor.-nitrous	65·5	32·7	$C_{10}H_{16}$	Turpentine	136	68
Cl_3PO	Phosph.oxych.	153·5	76·7	$C_{10}H_{16}O$	Camphor	152	76

Table X.

Anomalous Vapour-densities.

Molecular formulæ.	Gas or vapour.	Molec. weight, 1 vol.	Spec. grav., 1 vol.	Molecular formulæ.	Gas or vapour.	Molec. weight, 4 vols.	Spec. grav., 1 vol.
P_2	Phosphorus	62	62	Hg_2	Mercury	400	100
As_2	Arsenicum	150	150	Cd_2	Cadmium	224	56
As_2O_3	White arsenic	198	198	N_2O_2	Nitric oxide	60	15
$Al\,Cl_3$	Aluminic chl.	134	134	Cl_2O_4	Perchloric oxide	135	34
$Cr\,Cl_3$	Chromic chlr.	159	159	H_2SO_4	Sulphuric acid	98	24·5
$Fe\,Cl_3$	Ferric chlor.	162·5	162·5	NH_4Cl	Ammon. chlorid	53·5	13·4
				NH_4CN	Ammon. cyanid.	44	11
HgS	Cinnabar	232	77·3	NH_5S	Amm. sulphyd.	51	13
Cl_2O_3	Chlorous ahd.	119	39·7	$P\,Cl_5$	Phosph.pe..tach.	208·5	52·1
		3 vols.	1 vol.	$V\,Cl_6$	Vanadic hexach.	350	87·5

Most of these anomalies are explicable or removeable.

Table XI.

Primary Hydrides.

Molecular weight.	Formula.	Hydride.	Derivatives.		
2	H_2	Hydrogen	Cl H	Cu H	Et H
20	H F	Fluorhydric acid	—	K F	Et F
36·5	H Cl	Chlorhydric acid	Cl Cl	K Cl	Et Cl
81	H Br	Bromhydric acid	Cl Br ?	K Br	Et Br
128	H I	Iodhydric acid	Cl I	K I	Et I
18	H_2O	Water	Cl_2O	NaCl O	Et Me O
34	H_2S	Sulphydric acid	Cl_2S	Na H S	Et Ag S
81·5	H_2Se	Selenhydric acid	—	Na_2Se	Et H Se
131	H_2T	Tellurhydric acid	Cl_2T	Ag_2Te	Et_2Te
17	H_3N	Ammonia	Cl_3N	KH_2N	MeEtPhN
34	H_3P	Phosphine	Cl_3P	Ag_3P	Me_3P
78	H_3As	Arsine	Cl_3As	Ag_3As	Me_2ClAs
125	H_3Sb	Stibine	Cl_3Sb	Ag_3Sb	Me_3Sb
16	H_4C	Marsh-gas	Cl_4C	NaH_3C	—
32	H_4Si	Silic. hydrogen	Cl_4Si	Mg''_2Si	Et_4Si

Table XII.

Oxides of Primary Hydrides.

Formula.	Oxhydrate, &c.	Derivatives.	
	Monobasic.		
H Cl	Chlorhydric	K Cl	Et Cl
H Cl O	Hypochlorous	K Cl O	—
H $Cl O_2$	Chlorous	K $Cl O_2$	—
H $Cl O_3$	Chloric	K $Cl O_3$	—
H $Cl O_4$	Perchloric	K $Cl O_4$	Et $Cl O_4$
	Dibasic.		
H_2 S	Sulphydric	K H S	Et_2 S
H_2 S O	— — —	Cl_2 S O	Et_2 Se O
H_2 S O_2	— — —	Cl_2 S O_2	—
H_2 S O_3	Sulphurous	K H S O_3	Et_2 S O_3
H_2 S O_4	Sulphuric	K_2 S O_4	Et H S O_4
	Tribasic.		
H_3 P	Phosphine	Ag_3 P	Et_3 P
H_3 P O	— — —	Cl_3 P O	Et_3 P O
H_3 P O_2	Hypophosphorous	K H_2 P O_2	—
H_3 P O_3	Phosphorous	K_2H P O_3	Et_3 P O_3
H_3 P O_4	Phosphoric	K_3 P O_4	Et H_2P O_4
	Tetrabasic.		
H_4 S	Silic. Hydrogen	Mg''_2 Si	Et_4 Si
H_4 Si O	— — —	—	—
H_4 $Si O_2$	— — —	—	—
H_4 $Si O_3$	— — —	—	—
H_4 $Si O_4$	Silicic acid	K_4 Si O_4	Et_4 Si O_4

Table XIII.

Ortho- and Meta-Compounds.

Ortho-acid.	Formula.	Formula.	Meta-acid.
Phosphoric	H_3 P O_4 $(-H_2 O=)$	H P O_3	Metaphosphic
Orthonitric	H_3 N O_4 $(-H_2 O=)$	H N O_3	Nitric
Silicic	H_4 Si O_4 $(-H_2 O=)$	H_2 Si O_3	Metasilicic
Orthocarbonic	H_4 C O_4 $(-H_2 O=)$	H_2 C O_3	Carbonic

Table XIV.

Tri- and Tetra-Oxygen Acids.

Formula.	Tri- oxacid.	Formula.	Tetra- oxacid.
$H\ Cl\ O_3$	Chloric	$H\ Cl\ O_4$	Perchloric
$H\ Br\ O_3$	Bromic	$H\ I\ O_4$	Periodic
$H\ I\ O_3$	Iodic	$H\ Mn\ O_4$	Permanganic
$H\ N\ O_3$	Nitric		
$H\ P\ O_3$	Metaphosphic	$H_2\ S\ O_4$	Sulphuric
		$H_2\ Se\ O_4$	Selenic
$H_2\ S\ O_3$	Sulphurous	$H_2\ Te\ O_4$	Telluric
$H_2\ Se\ O_3$	Selenious	$H_2\ Mo\ O_4$	Molybdic
$H_2\ Te\ O_3$	Tellurous	$H_2\ V\ O_4$	Vanadic
$H_2\ V\ O_3$	Vanadous	$H_2\ W\ O_4$	Tungstic
$H_2\ C\ O_3$	Carbonic	$H_2\ Cr\ O_4$	Chromic
$H_2\ Si\ O_3$	Metasilicic	$H_2\ Mn\ O_4$	Manganic
$H_2\ Sn\ O_3$	Stannic	$H_2\ Fe\ O_4$	Ferric
$H_2\ Ti\ O_3$	Titanic		
$H_2\ Ta\ O_3$	Tantalic	$H_3\ N\ O_4$	Orthonitric
		$H_3\ P\ O_4$	Phosphoric
$H_3\ P\ O_3$	Phosphorous	$H_3\ As\ O_4$	Arsenic
$H_3\ As\ O_3$	Arsenious	$H_3\ Sb\ O_4$	Antimonic
$H_3\ Sb\ O_3$	Antimonious		
$H_3\ Bi\ O_3$	Bismuthous?	$H_4\ C\ O_4$	Orthocarbonic
$H_3\ B\ O_3$	Boracic	$H_4\ Si\ O_4$	Silicic

Table XV.

Chloro-derivatives.

Formula.	Compound.	Mono-chlor.	Di-chlor.	Tri-chlor.	Tetra-chlor.
H_2	Hydrogen	$H\ Cl$	Cl_2		
$C\ H_4$	Marsh-gas	$C\ H_3\ Cl$	$C\ H_2\ Cl_2$	$C\ H\ Cl_3$	$C\ Cl_4$
$C_2\ H_6$	Ethene	$C_2\ H_5\ Cl$	$C_2\ H_4\ Cl_2$	$C_2\ H_3\ Cl_3$	$C_2H_2Cl_4$ &c.
$C_3\ H_8$	Propene	$C_3\ H_7\ Cl$	$C_3\ H_6\ Cl_2$	$C_3\ H_5\ Cl_3$	$C_3H_4Cl_4$ &c.
$C_4\ H_{10}$	Butene	$C_4\ H_9\ Cl$	$C_4\ H_8\ Cl_2$	$C_4\ H_7\ Cl_3$	$C_4H_6Cl_4$ &c.
$C_2\ H_4$	Ethylene	$C_2\ H_3\ Cl$	$C_2\ H_2\ Cl_2$	$C_2\ H\ Cl_3$	$C_2\ Cl_4$
$C_2\ H_4O$	Aldehyd	$C_2\ H_3\ Cl\ O$	$C_2\ H_2\ Cl_2O$	$C_2\ H\ Cl_3O$	$C_2\ Cl_4O$
$C_2\ H_4O_2$	Acetic acid	$C_2\ H_3\ Cl\ O_2$	$C_2\ H_2Cl_2O_2$	$C_2\ H\ Cl_3O_2$	—

Table XVI.

Hydrocarbons.

§ I. *Fatty Class.*

Primary terms.		Secondary terms.		Tertiary terms.	
H_2	Hydrogen	—		—	
$C\ H_4$	Marsh-gas	$C\ H_2$	Methylene ?	—	
$C_2\ H_6$	Ethene	$C_2\ H_4$	Ethylene	$C_2\ H_2$	Klumene
$C_3\ H_8$	Propene	$C_3\ H_6$	Propylene	$C_3\ H_4$	Allylene
$C_4\ H_{10}$	Butene	$C_4\ H_8$	Butylene		
$C_5\ H_{12}$	Eupione	$C_5\ H_{10}$	Amylene		
$C_6\ H_{14}$	Caprene	$C_6\ H_{12}$	Caproylene		
$C_7\ H_{16}$	Œnanthene	$C_7\ H_{14}$	Œnanthylene		
$C_8\ H_{18}$	Octene	$C_8\ H_{16}$	Octylene		
$C_9\ H_{20}$		$C_9\ H_{18}$	Nonylene		
$C_{10}\ H_{22}$	Decatene	$C_{10}\ H_{20}$	Diamylene	$C_{10}\ H_{18}$	Menthene
$C_{11}\ H_{24}$		$C_{11}\ H_{22}$			
$C_{12}\ H_{26}$	Laurene	$C_{12}\ H_{24}$	Laurylene		
—		$C_{16}\ H_{32}$	Cetylene		
—		$C_{27}\ H_{54}$	Cerylene		
$C_x\ H_{2x+2}$	Paraffin	$C_{30}\ H_{60}$	Melissene		

§ II. *Aromatic Class.*

Primary terms.		Secondary terms.	
$C_6\ H_6$	Phenene	$C_6\ H_4$	Phenylene
$C_7\ H_8$	Benzoene	—	
$C_8\ H_{10}$	Xylene	$C_8\ H_8$	Cinnamene
$C_9\ H_{12}$	Retinene		
$C_{10}\ H_{14}$	Cymene		

§ III. *Miscellaneous.*

Turpentines.		Pyrogens.	
$C_5\ H_8$	Isoprene	$C_{10}\ H_8$	Naphthalene
$C_{10}\ H_{16}$	Terebene	$C_{12}\ H_8$	Chrysene
$C_{15}\ H_{24}$	Cubebene	$C_{14}\ H_{10}$	Anthracene
$C_{20}\ H_{32}$	Colophene	$C_{15}\ H_{12}$	Pyrene

Table XVII.

Series of Organic Families.

	Monatomic alcohols.		Monatomic acids.		Diatomic acids.	
Fatty	$C\ H_4\ O$	Methylic	$C\ H_2\ O_2$	Formic	—	
	$C_2\ H_6\ O$	Ethylic	$C_2\ H_4\ O_2$	Acetic	$C_2\ H_2\ O_4$	Oxalic
	$C_3\ H_8\ O$	Propylic	$C_3\ H_6\ O_2$	Propionic	$C_3\ H_4\ O_4$	Malonic
	$C_4\ H_{10}\ O$	Butylic	$C_4\ H_8\ O_2$	Butyric	$C_4\ H_6\ O_4$	Succinic
	$C_5\ H_{12}\ O$	Amylic	$C_5\ H_{10}\ O_2$	Valeric	$C_5\ H_8\ O_4$	Pyrotartric
	$C_6\ H_{14}\ O$	Ilexylic	$C_6\ H_{12}\ O_2$	Caproic	$C_6\ H_{10}\ O_4$	Adipic
	$C_7\ H_{16}\ O$	Anthylic	$C_7\ H_{14}\ O_2$	Œnanthic	$C_7\ H_{12}\ O_4$	Pimelic
	$C_8\ H_{18}\ O$	Octylic	$C_8\ H_{16}\ O_2$	Thetic	$C_8\ H_{14}\ O_4$	Suberic
	$C_9\ H_{20}\ O$	Nonylic	$C_9\ H_{18}\ O_2$	Pelargic	$C_9\ H_{16}\ O_4$	Anchoic
	—		$C_{10}\ H_{20}\ O_2$	Rutic	$C_{10}\ H_{18}\ O_4$	Sebacic
	—		$C_{11}\ H_{22}\ O_2$	Euodic		
	$C_{12}\ H_{26}\ O$	Laurylic	$C_{12}\ H_{24}\ O_2$	Lauric		
	—		$C_{13}\ H_{26}\ O_2$	Cocinic		
	—		$C_{14}\ H_{28}\ O_2$	Myristic		
	—		$C_{15}\ H_{30}\ O_2$	Benic		
	$C_{16}\ H_{34}\ O$	Cetylic	$C_{16}\ H_{32}\ O_2$	Palmitic		
	—		$C_{17}\ H_{34}\ O_2$	Margaric		
	—		$C_{18}\ H_{36}\ O_2$	Stearic		
	—		$C_{19}\ H_{38}\ O_2$	Balenic		
	—		$C_{20}\ H_{40}\ O_2$	Arachidic		
	—		$C_{21}\ H_{12}\ O_2$	Nardic		
	$C_{27}\ H_{56}\ O$	Cerylic	$C_{27}\ H_{54}\ O_2$	Cerotic		
	$C_{30}\ H_{62}\ O$	Melylic	$C_{30}\ H_{60}\ O_2$	Melissic		
Aromatic	$C_6\ H_6\ O$	Anilic	$C_6\ H_4\ O_2$	Collic	—	
	$C_7\ H_8\ O$	Benzylic	$C_7\ H_6\ O_2$	Benzoic	—	
	$C_8\ H_{10}\ O$	Xylylic	$C_8\ H_8\ O_2$	Toluic	$C_8\ H_6\ O_4$	Phthalic
	$C_9\ H_{12}\ O$	Retylic	$C_9\ H_{10}\ O_2$	Deltic	$C_9\ H_8\ O_4$	Insolinic ?
	$C_{10}\ H_{14}\ O$	Cymylic	$C_{10}\ H_{12}\ O_2$	Cuminic	—	

Alcohol	$C_2\ H_6\ O\ (-H_2+O=)$	$C_2\ H_4\ O_2$	Acetic acid
Glycol	$C_2\ H_6\ O_2(-H_4+O_2=)$	$C_2\ H_2\ O_4$	Oxalic acid

Table XVIII.

Homologous Fatty Groups.

	Primary terms.		Secondary terms.	
Formic family.	$C\ H_4$	Methene		
	$C\ H_4\ O$	Methylic alcohol		
	$C\ H_2\ O$	Formic aldehyd?		
	$C\ H_2\ O_2$	Formic acid		
	$C\ H_2\ O_3$	Carbonic acid		
Acetic family.	$C_2\ H_6$	Ethene	$C_2\ H_4$	Ethylene
	$C_2\ H_6\ O$	Alcohol	$C_2\ H_4\ O$	Elaylic alcohol
	$C_2\ H_6\ O_2$	Glycol		
	$C_2\ H_4\ O$	Aldehyd		
	$C_2\ H_4\ O_2$	Acetic acid		
	$C_2\ H_4\ O_3$	Glycolic acid		
	$C_2\ H_4\ O_4$	Glyoxylic acid		
	$C_2\ H_2\ O_4$	Oxalic acid		
Propionic family.	$C_3\ H_8$	Propene	$C_3\ H_6$	Propylene
	$C_3\ H_8\ O$	Propylic alcohol	$C_3\ H_6\ O$	Allylic alcohol
	$C_3\ H_8\ O_2$	Propylic glycol	—	
	$C_3\ H_8\ O_3$	Glycerin	—	
	$C_3\ H_6\ O$	Propionic aldehyd	$C_3\ H_4\ O$	Acrolic aldehyd
	$C_3\ H_6\ O_2$	Propionic acid	$C_3\ H_4\ O_2$	Acrolic acid
	$C_3\ H_6\ O_3$	Lactic acid	$C_3\ H_4\ O_3$	Pyruvic acid
	$C_3\ H_6\ O_4$	Glyceric acid	—	
	$C_3\ H_4\ O_4$	Malonic acid	—	
	$C_3\ H_4\ O_5$	Tartronic acid	$C_3\ H_2\ O_5$	Mesoxalic acid

Table XIX.

Homologous Fatty Groups (*continued*).

	Primary terms.		Secondary terms.	
Butyric family.	C_4H_{10}	Butene	C_4H_8	Butylene
	$C_4H_{10}O$	Butylic alcohol	—	
	$C_4H_{10}O_2$	Butylic glycol	—	
	C_4H_8O	Butyric aldehyd	—	
	$C_4H_8O_2$	Butyric acid	$C_4H_6O_2$	Crotonic acid
	$C_4H_8O_3$	Butilactic acid	—	
	$C_4H_6O_4$	Succinic acid	$C_4H_4O_4$	Fumaric acid
	$C_4H_6O_5$	Malic acid	$C_4H_4O_5$	Metatartric acid
	$C_4H_6O_6$	Tartaric acid	—	
Valeric family.	C_5H_{12}	Eupione	C_5H_{10}	Amylene
	$C_5H_{12}O$	Amylic alcohol	—	
	$C_5H_{12}O_2$	Amylic glycol	—	
	$C_5H_{10}O$	Valeric aldehyd	C_5H_8O	Angelic aldehyd
	$C_5H_{10}O_2$	Valeric acid	$C_5H_8O_2$	Angelic acid
	$C_5H_{10}O_3$	Phocic acid	—	
	$C_5H_8O_4$	Pyrotartric acid	$C_5H_6O_4$	Itaconic acid
Caproic family.	C_6H_{14}	Caprene	C_6H_{12}	Caproylene
	$C_6H_{14}O$	Hexylic alcohol	—	
	$C_6H_{12}O_2$	Caproic acid	$C_6H_{10}O_2$	Pyrotrebic acid
	$C_6H_{12}O_3$	Leucic acid	—	
	$C_6H_{10}O_4$	Adipic acid	—	
	—		—	
	—		$C_6H_8O_7$	Citric acid
	$C_6H_{10}O_8$	Mucic acid	—	

Table XX.

Homologous Aromatic Groups.

	Primary terms.		Secondary terms.	
Phenyl-Quinonic family.	C_6H_6	Phenene	C_6H_4	Phenylene
	C_6H_6O	Phenol		
	$C_6H_6O_2$	Pyrocatechin		
	$C_6H_6O_3$	Pyrogallin		
	$C_6H_4O_2$	Collic acid		
	$C_6H_6O_2$	Hydroquinone	$C_6H_4O_2$	Quinone
	$C_6H_6O_3$	Phloroglucin		
	$C_6H_4O_5$	Comenic acid		
Benzyl-Salicic family.	C_7H_8	Benzoene	C_7H_6	Benzylene
	C_7H_8O ...	Benzylic alcohol		
		Cresylic phenol		
	$C_7H_8O_2$	Benzylic glycol		
	C_7H_6O	Benzoic aldehyd		
	$C_7H_6O_2$...	Benzoic acid		
		Saloic acid		
	$C_7H_6O_3$	Ampelic acid, &c.		
	$C_7H_8O_2$...	Saligenin	$C_7H_6O_2$	Oreoselin
		Orcin		
	$C_7H_6O_2$	Salicic aldehyd		
	$C_7H_6O_3$	Salicic acid		
	$C_7H_6O_4$	Hypogal. acid, &c.	$C_7H_4O_4$	Ellagic acid
	$C_7H_6O_5$	Gallic acid	—	
	$C_7H_6O_6$	Pergallic acid?	$C_7H_4O_6$	Chelidonic acid
	—		$C_7H_4O_7$	Meconic acid.

Table XXI.

Primary Types of Double Decomposition.

H . Cl	Chloride or Hydride	Cl . Cl	Na . Cl	Et . Cl
$\left.\begin{matrix}H\\H\end{matrix}\right\}O$	Oxide or Hydrate	$\left.\begin{matrix}Cl\\H\end{matrix}\right\}O$ $\left.\begin{matrix}Cl\\Cl\end{matrix}\right\}O$	$\left.\begin{matrix}Na\\H\end{matrix}\right\}O$ $\left.\begin{matrix}Na\\Na\end{matrix}\right\}O$	$\left.\begin{matrix}Et\\H\end{matrix}\right\}O$ $\left.\begin{matrix}Et\\Et\end{matrix}\right\}O$
$\left.\begin{matrix}H\\H\\H\end{matrix}\right\}N$	Nitride or Amide	$\left.\begin{matrix}H\\H\\H\end{matrix}\right\}N$ $\left.\begin{matrix}I\\I\\H\end{matrix}\right\}N$ $\left.\begin{matrix}Cl\\Cl\\Cl\end{matrix}\right\}N$	$\left.\begin{matrix}Na\\H\\H\end{matrix}\right\}N$ $\left.\begin{matrix}\\\\H\end{matrix}\right\}N$ $\left.\begin{matrix}Na\\Na\\Na\end{matrix}\right\}N$	$\left.\begin{matrix}Et\\H\\H\end{matrix}\right\}N$ $\left.\begin{matrix}Et\\Et\\H\end{matrix}\right\}N$ $\left.\begin{matrix}Et\\Et\\Et\end{matrix}\right\}N$
$\left.\begin{matrix}H\\H\\H\\H\end{matrix}\right\}C$	Carbide or Methide	$\left.\begin{matrix}Cl\\H\\H\\H\end{matrix}\right\}C$ Cl_2H_2C Cl_3HC Cl_4C	$\left.\begin{matrix}Na\\H\\H\\H\end{matrix}\right\}C$	$\left.\begin{matrix}Et\\H\\H\\H\end{matrix}\right\}C?$

Table XXII.

Multiple and Mixed Types.

H_2Cl_2 H_4O_2 H_6N_2	Dichloride Dihydrate Diamide	$S''Cl_2$ — —	$Zn''Cl_2$ $Zn''H_2O_2$ $Zn''H_4N_2$	$Etn''Cl_2$ $Etn''H_2O_2$ $Etn''H_4N_2$
H_3Cl_3 H_6O_3 H_9N_3	Trichloride Trihydrate Triamide	$B'''Cl_3$ $B'''H_3O_3$ $B'''H_6N_3$	$Sb'''Cl_3$ $Sb'''H_3O_3$ $Sb'''H_6N_3$	$Gly'''Cl_3$ $Gly'''H_3O_3$ $Gly'''H_6N_3$
$\left\{\begin{matrix}H\ Cl\\H_2O\end{matrix}\right.$	Chlorid-hydrate	$\left.\begin{matrix}(SO_2)''\\H\end{matrix}\right\}\begin{matrix}Cl\\O\end{matrix}$		
$\left\{\begin{matrix}H\ Cl\\H_3N\end{matrix}\right.$	Chlorid-amide		$\left.\begin{matrix}(SO_2)''\\H_2\end{matrix}\right\}\begin{matrix}Cl\\N\end{matrix}$	
$\left\{\begin{matrix}H_3N\\H_2O\end{matrix}\right.$	Hydrat-amide			$\left.\begin{matrix}(SO_2)''\\H_3\end{matrix}\right\}\begin{matrix}N\\O\end{matrix}$